

CYLINDER CARE PRO™

For all our solutions we offer optional software algorithms improving efficiency of the cylinder lubrication systems. The software ensures that you get the value from your HJ Lubricators' solution and provides additional lubrication flexibility in challenging operational scenarios with slow steaming, green fuels and dual-fuel engines.

Application	Automatic Cleaning Sequence	Multi-timing	Delta-timing	Sulphur regulation
HJ Smartlube 4.0	Yes	Yes		Yes
HJ Lubtronic 2.0	Yes		Yes	Yes
HJ X-Tronic	Yes			Yes
HJ Mechtronic	Yes			Yes

Multi-Timing Injection Algorithm

The algorithm provides multiple cylinder oil injections in a single piston stroke. The timing combines:

Example: 1 x injection into the scavenging air swirl above the piston covering the upper liner surface to protect the combustion area.

With 1 x injection into the ring pack (compression stroke) for enhanced cleaning and 1 x injection into the ring pack (combustion stroke) for enhanced cleaning.

... all in the same piston stroke!

Feed rate (g/kWh)	Quantity (%)	Injection Method
0.55	60	SIP injection
	30	Ring pack compression stroke
	10	Ring pack combustion stroke

Delta-Timing Algorithm

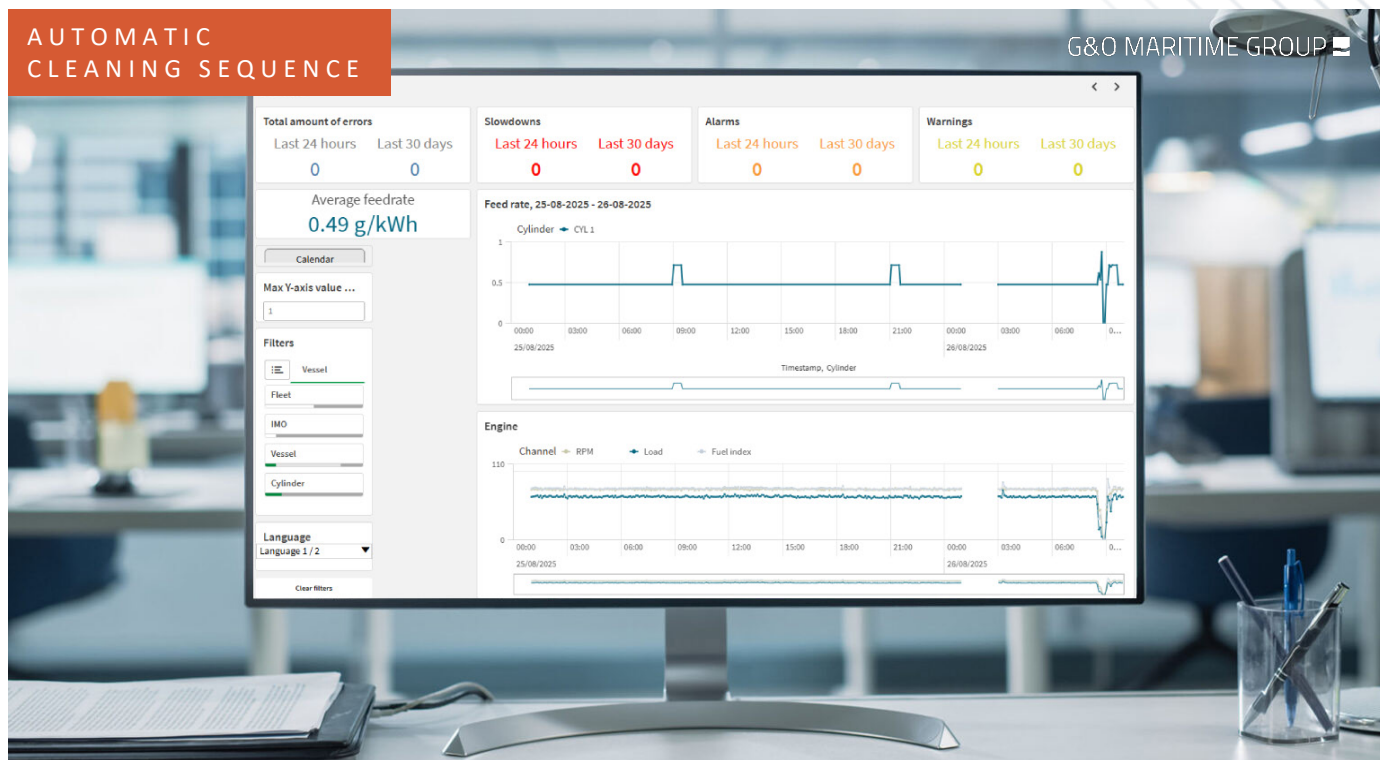
On each engine revolution, the Delta-Timing algorithm can change the crankshaft angle at which cylinder oil is injected.

This can be customized to your needs. For example, if the algorithm is set to inject 40% in the ring pack and 60% according to SIP timing, the algorithm will inject 2 full injections into the ring pack and 3 full injections according to SIP timing over a total of 5 revolutions, as $2/5 = 40\%$ and $3/5 = 60\%$.

Feed rate (g/kWh)	Quantity (%)	Injection Method
0.55	60	SIP injection
	40	Ring pack compression stroke

Sulphur Regulation Algorithm

The feed rate is automatically adjusted according to the sulphur level of the fuel oil. This prevents corrosion and build-up of deposits leading to long term damage of liner and rings.



AUTOMATIC CLEANING SEQUENCE™

For all our solutions we offer optional software algorithms improving efficiency of the cylinder lubrication systems. Automatic Cleaning Sequence maintains optimum cylinder condition by preventing deposit build-up behind the piston rings.

Automatic Cleaning Sequence

The ACS periodically increases the cylinder oil feed rate to facilitate better cleaning of the cylinder, piston and piston rings. This is especially relevant using low BN lube oil where detergency is less than using high BN.

The algorithm injects an extra amount of oil into the piston rings at regular intervals to react with and flush out deposited particles.

Example: 2 times a day, each sequence lasting 30 mins. Increasing feed rate from e.g. 0.5 to 1.2 g/kWh (average feed rate 0,53 g/kWh during 48 hrs.)

CylinderCare Pro

HJ Lubricators offers optional software algorithms for optimizing lubrication and ensuring good cylinder condition – we call it CylinderCare Pro.

The software provides full lubrication flexibility, which is very relevant in challenging operational scenarios where speed, fuel type and oil prices vary.

The system is managed by the crew via the HMI.

Features:

- Control the amount of extra oil injected into the ring pack
- Control frequency within a 24 hrs. cycle
- Frequency, timing and amount is customizable by engine crew

Feed rate:

